

REMARKS

Claims 1-5 have been examined and have been rejected under 35 U.S.C. § 102(b).

Preliminary Matters

The Examiner has indicated that the drawing corrections submitted on December 10, 2002 are acceptable. Therefore, Applicant is submitting substitute formal drawings with this Amendment.

Rejections under 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-5 as being anticipated by U.S. Patent No. 5,920,767 to Horie et al. ("Horie").

A. Claim 1

Applicant submits that claim 1 is patentable over the cited reference. For example, claim 1 recites the formation of a plurality of layers in parallel with an activation layer. Claim 1 further recites the formation of a first groove penetrating through at least some of the plurality of layers. The first groove is then etched along a specified layer to form a pair of second grooves. The second grooves are filled up with a material having a refractive index higher than that of the specified layer.

Applicant submits that Horie fails to teach the above features. For example, as shown in Fig. 6, a first groove 120 is formed through a plurality of layers. The first groove is then etched along etching stop layer 10 to form what appears to be second grooves (Fig. 6; col. 12, lines 32-

36). The second grooves are then filled by a second clad layer 109 (col. 12, lines 35-37).

However, the second grooves are not filled with a material having a higher refractive index than the etch stop layer 10 (i.e. specified layer). Rather, the etch stop layer 10 has a higher refractive index than the material of second clad layer 109. For example, the etch stop layer 10 is preferably made of GaAs, and second clad layer 109 is made of AlGaAs (col. 9, lines 50-55; col. 11, lines 49-54). Applicant submits that AlGaAs has a lower refractive index than GaAs. Thus, the second grooves are not filled with a material (i.e. second clad layer 109) having a refractive index higher than that of the specified layer (i.e. etch stop layer 10).

Further, the Examiner maintains that the material of the second clad layer 109 is SiN_x. Therefore, the Examiner maintains that the second clad layer 109 has a higher refractive index than the etch stop layer 10. However, the reference does not disclose that the second clad layer 109 is made of SiN_x. Rather, the reference discloses that SiN_x is used as an etching mask for etching layers such as groove 120 (col. 10, lines 45-50). Therefore, Applicant submits that the Examiner may have misinterpreted and/or misapplied the reference in this regard.

Claim 1 further recites that the pair of second grooves are etched to a predetermined position in the specified layer.

Applicant submits that Horie fails to teach or disclose such a feature. For example, the reference discloses that the stop layer 10, at the bottom of the groove 120, is eliminated by etching (col. 12, lines 33-36). However, the reference fails to teach or disclose that the etching stop layer 10 is etched to a “predetermined” position, as required by claim 1.

In light of the above, Applicant submits that claim 1 is patentable over the cited reference.

B. Claim 2

Since claim 2 contains features which are analogous to the features recited in claim 1, Applicant submits that claim 2 is patentable for at least analogous reasons as presented above.

C. Claim 3

Since claim 3 contains features which are analogous to the features recited in claim 1, Applicant submits that claim 3 is patentable for at least analogous reasons as presented above.

In addition, claim 3 recites that another layer, made of a different material from the material having the high refractive index, is formed so as to contact with a surface portion of the first groove.

Applicant submits that Horie fails to teach or disclose the above feature. For example, as shown in Fig. 6, second clad layer 109 fills the second grooves as well as the entire first groove 120 (which includes the surface of first groove 120). Therefore, the reference fails to teach another layer, different from the material of the second clad layer 109, which is formed to contact with a surface portion of the first groove 120.

Accordingly, Applicant submits that claim 3 is patentable over the cited reference.

D. Claim 4

Since claim 4 contains features which are analogous to the features recited in claim 1, Applicant submits that claim 4 is patentable for at least analogous reasons as presented above.

In addition, claim 4 recites that layers made of a material having a refractive index lower than the material filled in the second grooves are laminated on the material exposed in the first groove.

Applicant submits that Horie fails to teach or disclose the above feature. For example, as stated above in our comments for claim 3, Fig. 6 shows that the second clad layer 109 fills the second grooves as well as the entire first groove 120 (which includes material exposed by the first groove 120). Therefore, no other material, having a refractive index lower than the material filled in the second grooves, is laminated on the material exposed in the first groove.

Accordingly, Applicant submits that claim 4 is patentable over the cited reference.

E. Claim 5

Since claim 5 is dependent upon claim 4, Applicant submits that such claim is patentable at least by virtue of its dependency.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Amendment under 37 C.F.R. § 1.111
U.S. Application No. 09/873,218

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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